REMARKS

Applicant respectfully requests reconsideration of the subject application in view of the amendments and remarks set forth herein.

1. **Previous Issues Withdrawn**

Applicant notes with appreciation that the issues continue to narrow with respect to prosecution of this application. In the outstanding Office Action dated October 17, 2006, the following rejections have been withdrawn:

- Section 112 rejection of claim 4;
- Section 102 rejection of claims 1-13, 20 and 22-23 over U.S. Patent No. 4,543,281 to Pedersen et al. (the "Pedersen '281 patent");
- Section 103 rejection of claims 9, 17-19 and 23 based on the Pedersen '281 patent in view of U.S. Patent No. 5,453,453 to Lamon et al. (the "Lamon '453 patent');
- Section 103 rejection of claims 9, 14-16 and 23 based on the Pederson '281 patent in view of the Lamon '453 patent and U.S. Patent No. 4,421,661 to Claar et al. (the "Claar '661 patent"); and
- Section 103 rejection of claims 9, 21 and 23 based on the Pederson '281 patent in view of the Lamon '453 patent and U.S. Patent No. 5,167,876 to Lem et al. (the "Lem '876 patent").

2. **Claim Amendments**

Applicant has amended independent claims 1, 22 and 24 to more precisely define the presently claimed subject matter. In particular, the independent claims have been amended to recite that "hydroxide [has] a formula of $M_x(OH)_y$, wherein 'M' is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium, and wherein 'x' and 'y' are integers." Support for the

foregoing claim amendments is found in the specification, as filed (see, e.g., the Abstract, page 9, line 18 to page 15, line 18; page 27, line 18 to page 19, line 17; and Figs. 1-3). In addition, dependent claims 9, 23 and 27 have been amended to more clearly recite the subject matter thereof in view of the amendments to independent claims 1, 22 and 24, respectively. Support for the amendments to dependent claims 9, 23 and 27 is found, for example, in original dependent claims 9, 23 and 27. Finally, dependent claim 20 has been amended to set forth a formula for the recited aluminum hydroxide, i.e., $Al(OH)_3$. Support for the amendment to claim 20 is found in the specification, as filed (see, e.g., page 7, lines 16-19 and accompanying Fig. 3; page 14, lines 3-21). Applicant respectfully submits that no new matter is introduced by way of the foregoing claim amendments. Prompt entry of the proposed claim amendments is respectfully requested.

3. Section 102 Rejection

The outstanding Office Action sets forth a single rejection under 35 USC §102. More particularly, claims 1-2, 5-9, 20, 22-24 and 26-27 are rejected under 35 USC §102(e) based on U.S. Patent No. 5,804,294 to Gregg et al. (the "Gregg '294 patent"). Reconsideration of this Section 102 rejection is respectfully requested.

As noted in a previous submission, the Gregg '294 patent is directed to microporous insulation materials of specific compositional form. Independent claim 1 is representative of the insulation materials contemplated by the Gregg '294 patent:

> 1. A microporous insulation material comprising, in weight percent based upon the dry weight of the microporous insulation material:
>
> (a) 20-60 wt % inorganic particulate material;
>
> (b) 10-60 wt % endothermic compound;
>
> (c) 5-20 wt % opacifier;
>
> (d) 3-15 wt % inorganic fiber;
>
> (e) 0-6 wt % dry resin binder; and
>
> 50-89 wt % being said inorganic particulate material and said endothermic compounds, said inorganic particulate material being a different substance than said endothermic compound.

The Gregg '294 patent goes on to disclose endothermic compounds that may be employed in the Gregg microporous insulation material.

> Examples of the forgoing endothermic compounds which can be utilized in the present invention include, but are not limited to, alumina trihydrate, magnesium carbonate-hydrate, melamine and water. As used herein, the term "endothermic compound" with respect to alumina trihydrate and magnesium carbonate-hydrate means that these materials are endothermic upon dehydration. [Col. 3, lines 58-64; emphasis added]

The examiner states in the outstanding Office Action that "aluminum trihydrate is a synonym for aluminum hydroxide as defined in Hawley's Condensed Chemical Dictionary." [Office Action at page 4.] Applicant takes issue with the examiner's statement and respectfully refutes the examiner's position that the "aluminum trihydrate" disclosed in the Gregg '294 patent is an aluminum hydroxide having a formula of $M_x(OH)_y$ as claimed by applicant in independent claim 1, i.e., $Al(OH)_3$. To the contrary, applicant respectfully submits that the alumina trihydrate disclosed in the Gregg '294 patent is a hydrated aluminum having the formula "$Al \cdot 3\ H_20$". Applicant further respectfully submits that the microporous insulation material disclosed by Gregg et al. fails to teach or suggest applicant's claimed articles of manufacture because dehydration-based endothermic behavior, as disclosed in the Gregg '294 patent is altogether different from "irreversible decomposition" of an hydroxide, as disclosed and claimed by applicant, both in nature and effect.

More particularly, applicant respectfully submits that the term "aluminum trihydrate" has a second and equally accepted meaning to persons skilled in the art, namely a hydrated aluminum having the formula "$Al \cdot 3\ H_20$" . In support of applicant's position, applicant submits herewith copies of two (2) printouts from the PubChem website.[1] The first exhibit shows search results for the search term "alumina trihydrate"

[1] The PubChem website is maintained by the National Center for Biotechnology Information. Established in 1988 as a national resource for molecular biology information, NCBI creates public databases, conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information - all for the better understanding of molecular processes affecting human health and disease.

[Exhibit A]. As shown on Exhibit A, the search uncovered IUPAC compound "aluminum trihydrate" having a chemical formula of "AlH6O3" and corresponding to CID #6328211. The second exhibit shows additional information regarding CID #6328211, including specifically an enlarged diagram of the molecular structure. As is readily apparent from such diagram, aluminum/alumina trihydrate corresponds to a tri-hydrate of aluminum.

Applicant respectfully submits that the alternative meaning ascribed to the term "aluminum/alumina trihydrate" by the enclosed Exhibits is the correct meaning for purposes of the Gregg '294 patent for at least three reasons:

- As noted above, the Gregg '294 patent identifies a handful of compounds that are adapted to function as endothermic compounds for purposes of the disclosed microporous insulation material. Aside from alumina trihydrate, Gregg et al. identify a hydrate (magnesium carbonate-hydrate) and a heterocyclic compound (melamine) and water. [Col. 3. lines 58-61] Based on this grouping of three compounds, applicant respectfully submits that a person of ordinary skill in the art would expect and understand the alumina trihydrate to be a hydrate, rather than a non-hydrate.

- As also noted above, the Gregg '294 patent expressly states that "the term 'endothermic compound' with respect to alumina trihydrate and magnesium carbonate-hydrate means that these material are endothermic upon dehydration." [Col. 3, lines 61-64; emphasis added] Clearly, this statement conveys to a person skilled in the art that the alumina trihydrate takes the form of a hydrate, i.e., "Al · 3 H_2O", whereas melamine is the only disclosed compound that is not a hydrate.

- Fig. 3 of the Gregg '294 patent includes test results for a system that includes ATH (aluminum/alumina trihydrate), namely Test Run #5. Applicant provides test data for a system according to the present disclosure that includes $Al(OH)_3$,

namely Fig. 3. With initial reference to applicant's data, it is noted that decomposition of the $Al(OH)_3$ at about 200°C. When the system reaches 200°C, a plateau is established while irreversible decomposition takes place. If the ATH utilized in the Gregg '294 patent were $Al(OH)_3$, one would expect to see a similar plateau in Test Run #5 at about 392°F. However, the test data provided by Gregg et al. reflects a substantially constant upward ramping of temperature in the 300 to 400°F range. Accordingly, a comparison of test data further demonstrates that the Gregg '294 patent neither teaches nor suggests the utilization of $Al(OH)_3$ in the disclosed microporous insulation material.

For at least the foregoing reasons, applicant respectfully submits that, when referencing "alumina trihydrate," the Gregg '294 patent is referencing a hydrate of the formula "$Al \cdot 3\ H_20$". As such, the Gregg '294 patent fails to teach or suggest a system that includes a hydroxide of formula $M_x(OH)_y$, wherein "M" is selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, beryllium, aluminum and ammonium, and wherein "x" and "y" are integers. In particular, the Gregg '294 patent fails to teach or suggest a system that includes aluminum hydroxide of formula $Al(OH)_3$.

Not only does applicant's claimed invention patentably distinguish over the Gregg '294 patent based on the fundamentally different endothermic agent employed in applicant's claimed articles of manufacture, but applicant's claimed invention further distinguishes based on at least the following additional claim recitations:

- "the hydroxide being effective to absorb said level of heat at least in part based on an irreversible decomposition of said hydroxide;" and
- "wherein irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder."

Applicant respectfully submits that the Gregg '294 patent fails to teach or suggest the use of an endothermic agent (specifically, a hydroxide of formula $M_x(OH)_y$) that is effective to absorb heat to protect a flight data recorder based on irreversible decomposition of the hydroxide. Indeed, as noted above, Gregg et al. specifically teach that the disclosed alumina trihydrate and magnesium carbonate-hydrate "are endothermic upon dehydration." This is a clear contrary teaching relative to applicant's claimed article of manufacture. Indeed, dehydration is not an irreversible decomposition of a compound. Rather, dehydration is clearly a reversible phenomenon. Moreover, the Gregg '294 patent is silent as to the desirability of forming a thermal insulation oxide layer around the flight data recorder.

For at least the foregoing reasons, applicant respectfully submits that independent claims 1, 22 and 24 patentably distinguish over the Gregg '294 patent. In addition, dependent claims 2, 5-9, 20, 23 and 26-27 – which depend directly or indirectly from independent claims 1, 22 and 24 – patentably distinguish over the Gregg '294 patent for at least the reason noted herein with respect to independent claims 1, 22 and 24. Accordingly, reconsideration and withdrawal of the outstanding Section 102 rejection of all such claims based on the Gregg '294 patent are respectfully requested.

4. Section 103 Rejections

The outstanding Office Action sets forth the following rejections under 35 USC §103(a):

- Claims 1-2, 5-13, 20, 22-24 and 26-27 stand rejected under 35 USC §103(a) based on U.S. Patent No. 5,370,814 to Salyer (the "Salyer '814 patent") in view of U.S. Patent No. 4,543,281 (the "Pedersen '281 patent");
- Claims 9, 17-19, 23 and 27 stand rejected under 35 USC §103(a) based on the Salyer '814 patent and the Pedersen '281 patent, further in view of U.S. Patent No. 5,453,453 to Lamon et al. (the "Lamon '453 patent');

- Claims 9, 14-16, 23 and 27 stand rejected under 35 USC §103(a) based on the Salyer '814 patent and the Pedersen '281 patent, further in view of the Lamon '453 patent and U.S. Patent No. 4,421,661 to Claar et al. (the "Claar '661 patent"); and
- Claims 9, 21, 23 and 27 stand rejected under 35 USC §103(a) based on the Salyer '814 patent and the Pedersen '281 patent, further in view of the Lamon '453 patent and U.S. Patent No. 5,167,876 to Lem et al. (the "Lem '876 patent").

Reconsideration of the foregoing Section 103 rejections is respectfully requested.

As noted in applicant's previous submission, applicant notes that the various tertiary references are generally relied upon by the Examiner to address specific hydroxide materials. Applicant further notes that only the initial obviousness rejection is directed to applicant's independent claims, i.e., claims 1, 22 and 24.

With reference to the obviousness rejection of independent claims 1, 22 and 24, applicant respectfully submits that the proposed combination of the Salyer '814 patent and the Pedersen '281 patent fails to teach or suggest applicant's claimed article of manufacture/combination, which recite, *inter alia*, a flight data recorder, a hydroxide in an amount sufficient ... to protect the electronics within the flight data recorder from damage, wherein the hydroxide effects the desired level of heat absorption at least in part based on an irreversible decomposition of the hydroxide; and the irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder.

The proposed combination clearly lacks any teaching or suggestion that (i) heat absorption to protect a flight data recorder through irreversible decomposition of an hydroxide, and/or that a thermal insulation oxide layer may be formed to further abate a temperature rise within the flight data recorder. More particularly, the Salyer '814 patent

expressly teaches that the disclosed phase change materials (PCMs)[2] are vented from the enclosure upon vaporization. As such, the systems of the Salyer '814 patent exclude the possibility that a PCM would be present to undergo irreversible decomposition for purposes of continued heat absorption. Moreover, since the Salyer '814 patent vents the vaporized PCMs to the atmosphere, no PCM material would remain to form a thermal insulation oxide layer around the flight data recorder.

The Salyer '814 patent is consistent and clear as to the venting of the PCMs, as demonstrated by the following teachings:

> A plurality of blow-out vents or plugs 15 are provided in the protective casing 14. The vents 15 release at a predetermined chamber pressure level to provide passages for the vaporized phase change material to exit the chamber 18. [Col. 6, lines 58-62; emphasis added]
>
> In the case of an aircraft mishap, after the PCM has vaporized and left the chamber 18 via the vents 15, the silica remains and provides an effective layer of insulation through establishing a still air environment that reduces the rate of heat transfer across the chamber 18. With little or no PCM left in the chamber 18, the temperature of the silica will begin to increase from the outer portion of the chamber 18 (adjacent inner wall 14a), to the inner portion thereof. This will cause the dye to degrade and fade to a white color. Thus, the faded silica provides an indication as to how far inward the high temperature boundary has progressed through the silica. [Col. 7, lines8-20; emphasis added]
>
> The container is provided with pressure release valves to allow escape of steam (to remove heat) when the container is exposed to fire. [Col. 7, lines 61-64]
>
> The vaporized fluid is emitted to atmosphere through vent line 66. Accordingly, by evaporating the PCM in the chamber 54, a substantial amount of heat is absorbed from the pad 52, thereby preventing brake fade. [Col. 8, lines 44-48; emphasis added]

The secondary reference relied upon in the outstanding Office Action, i.e., the Pederson '281 patent, fails to cure the clear deficiencies in the Salyer '814 patent. First, there is no basis for concluding that a skilled artisan would be motivated to utilize the barrier material disclosed by the Pederson '281 patent -- a copolymer matrix of aluminum hydroxide and calcium carbonate or calcium-magnesium carbonate -- with silica particles to define a "free flowing, conformable powder-like mix," as taught by the Salyer '814.

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[2] As acknowledged in the outstanding Office Action, hydroxides are not among the materials disclosed by the Salyer '281 patent as a potentially effective PCM.

Indeed, there is no basis for believing that the Pederson copolymer matrix would work effectively in a silica-based system, as disclosed by the Salyer '814 patent.

Even if a skilled artisan were motivated to attempt to combine the Pederson copolymer with Salyer's silica system, however, the combined teachings would yield a vented system that would be designed to discharge the non-silica components upon vaporization, i.e., before irreversible decomposition. Accordingly, even if combined in the manner proposed by the Examiner, the combination would fail to teach or suggest applicant's claimed article/combination because the hydroxide would not protect the electronics within the flight data recorder "at least in part based on an irreversible decomposition of said hydroxide," and irreversible decomposition of the hydroxide would not form "a thermal insulation oxide layer around the flight data recorder."

For at least the foregoing reasons, applicant respectfully submits that applicant's independent claims 1, 24 and 26 patentably distinguish over the proposed Salyer/Pedersen combination. Claims 2-13, 20, 22-23 and 27, which depend directly or indirectly from the noted independent claims, are patentable for at least the reasons noted with respect to such independent claims. Reconsideration and withdrawal of the obviousness rejections based on the Salyer/Pedersen combination are respectfully requested.

With reference to the additional obviousness rejections -- wherein tertiary references are relied upon for their specific hydroxide-related disclosures -- applicant respectfully submits that none of these additional references, whether taken alone or in combination with each other or with the primary/secondary references (i.e., the Salyer '814 patent and/or the Pedersen '281 patent), teaches or suggests applicant's claimed article/combination, which include a flight data recorder, a hydroxide in an amount sufficient ... to protect the electronics within the flight data recorder from damage, wherein the hydroxide effects the desired level of heat absorption at least in part based on an irreversible decomposition of the hydroxide; and the irreversible decomposition of the hydroxide forms a thermal insulation oxide layer around the flight data recorder.

Accordingly, applicant respectfully submits that the foregoing Section 103 rejections – which are directed to applicant's dependent claims – should be reconsidered and withdrawn because applicant's various dependent claims patentably distinguish over the art of record for at least the reasons noted with respect to independent claims 1, 22 and 24. Reconsideration and withdrawal of the Section 103 rejections are respectfully requested.

Applicant respectfully submits that all claims are in condition for allowance. Prompt action leading to an early Notice to this effect is earnestly solicited. If the Examiner believes that a telephone conversation may be useful in advancing prosecution of this application, he is invited to contact applicant's attorney at the number set forth below.

Respectfully submitted,

Date: April 16, 2007

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☐ 1: CID: 6328211 Related Structure

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IUPAC: aluminum trihydrate
MW: 81.027 | MF: AlH6O3

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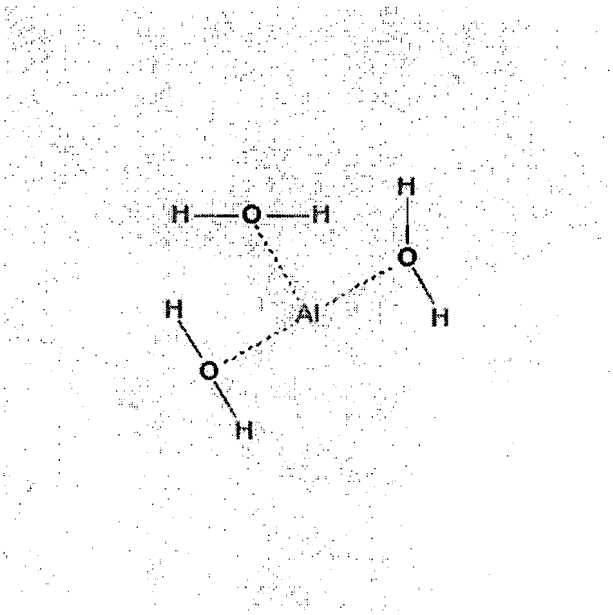
Jan 16 2007 05:58:20

Exhibit B

Compound Summary:



CID: 6328211
Unique Components: 2

NLM Toxicology:
Link1, Link2

Substances: 9 Links

Similar Compounds: 2

Structure Search

Mesh | Synonyms | Properties | Descriptors | Category

Medical Subject Annotations: (Total:7) Display: Next 1 | All

Aluminum Hydroxide
A compound with many biomedical applications: as a gastric antacid, an anti dentifrices, as an emulsifier, as an adjuvant in bacterins and vaccines, in water p

Show MeSH Tree Structure

Pharmacological Action:
Adjuvants, Immunologic
Antacids

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administration and dosage adverse effects analogs and der

analysis	antagonists and inhibitors	blood
chemical synthesis	chemistry	contraindication
diagnostic use	history	immunology
isolation and purification	metabolism	pharmacokineti
pharmacology	poisoning	radiation effects
standards	therapeutic use	toxicity
urine		

Depositor-Supplied Synonyms: (Total: 140)

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Dialume
Tricreamalate
Alhydrogel
Alugelibye
Calmogastrin
Alumigel
Amphogel
Amphojel
Ascriptin
Boehmite

Properties Computed from Structure:

Molecular Weight: 81.0274g/mol
Molecular Formula: AlH_6O_3

Hydrogen Bond Donor Count: 3
Hydrogen Bond Acceptor Count: 3
Rotatable Bond Count: 0
Topological Polar Surface Area: 3

Descriptors Computed from Structure:

IUPAC Name: aluminum trihydrate
Canonical SMILES: O.O.O.[Al]

Substance Category:

Biological Properties: 2 Links

Journal Publishers: 1 Link
Metabolic Pathways: 3 Links
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Toxicology: 2 Links

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